REMARKS

Please consider the following Applicant's response to the outstanding rejection of January 24, 2008.

The Prior Art

US 6,936,857 Melnik et al (Melnik); "Dislocation Reduction in AlN and GaN Bulk Crystals Grown by HVPE", Albrecht et al (Albrecht).

The Rejection

Claims 1, 2 and 8, all of the active claims, were rejected under 35 U.S.C. § 102(a) and § 102(e) as being anticipated by Melnik.

These same claims were rejected on the same basis as being anticipated by Melnik "as evidenced by Albrecht".

Finally, these same claims were rejected under 35 U.S.C. § 103(a) as being unpatentable over Albrecht in view of Melnik. The Examiner's position is set forth in the Action and will not be repeated here except as necessary to an understanding of Applicant's traversal which is now presented.

Traversal of the Rejections

The main distinguishing features of the present invention reside in realizing for the first time the formation of a self-supported nitride semiconductor substrate which simultaneously not only has a large size, namely a thickness of 200 μm or more and a diameter of 10 mm or more, but also has an X-ray diffraction half width of 500 seconds or less in a {20-24} diffraction plane. See the present specification at page 5, lines 6-12.

In contrast, Albrecht teaches what can be viewed as an actually realized size of 7 x 6 x 0.1 mm^3 at a maximum (see Albrecht at page 454, lines 7-8 in Experimental), albeit Albrecht does describe an X-ray diffraction half width of 110-180 seconds in a {11-24} diffraction plane.

If the Examiner will refer to Section 2.1 in Albrecht which is entitled "Sample Growth" on page 454, it is seen that only a free standing bulk GaN sample having a maximum size of 7 x 6 x 0.1 mm^3 could be obtained due to fracturing of the layers caused by lattice mismatch and the differing thermal expansion coefficients of GaN and SiC.

Accordingly, Applicant submits that it is quite clear that the HVPE method described in Albrecht cannot and will not produce any free standing bulk GaN material having a diameter of 10 mm or more as disclosed and claimed in the present application.

Thus, Applicant respectfully submits that the conclusion that the HVPE method can be used as disclosed in Albrecht to form a GaN crystal having a large size with no difficulty by crystal growth is not correct, i.e., it is difficult to obtain large size crystals of GaN even using HVPE.

As compared to Albrecht, Melnik describes a GaN crystal of large size, but Melnik is silent regarding any X-ray diffraction half width in a {20-24} diffraction plane. In more detail, the value of the X-ray diffraction half width described in Melnik is one evaluated using the half width of an X-ray rocking curve in a {0002} diffraction plane. This corresponds to conventional technology and is discussed in the present application. This conclusion is quite clear based on Melnik from the disclosure in Melnik that:

"The high quality of the resultant material was verified by the X-ray rocking ω-scan curves (e.g., 300 arc sec for the FWHM for the (0002) GaN reflection)".

The Examiner is requested to refer to col. 11, lines 32-35 regarding embodiment 1 of Melnik.

Referring now to the present Action, page 3, lines 2-5, the Examiner states:

"Since Melnik teaches that the FWHM of the semiconductor is less than 360, it can be assumed, expected and inherent that the plane of {20-24} within Melnik's semiconductor is less than 360 arc seconds."

Applicant respectfully submits this conclusion by the Examiner is incorrect for the reasons now explained.

First, all self-supported nitride semiconductor substrates having an FWHM of less than 360 will not automatically or inherently satisfy the requirements of the present claims, i.e., have an X-ray diffraction half width of 500 seconds or less in a {20-24} diffraction plane.

This can be seen from the following Table A which is set forth in the 1.132 Declaration dated September 20, 2006, i.e., even if the X-ray diffraction half width is 250 seconds or less in a {0002} symmetric diffraction plane, there will be the case where the X-ray diffraction width in a {20-24} diffraction plane or a {11-24} diffraction plane will have a value of more than 500 seconds. For the Examiner's reference, Comparative Example 1 and Comparative Example 2 in Table A are set forth below.

Table A

No.	X-Ray Diffraction Half Width (second)		
	{20-24} Plane	{11-24} Plane	{0002}Plane
Example 1	278	286	275
Example 2	322	336	254
Comparative Example 1	550	568	125
Comparative Example 2	820	845	54

Applicant thus respectfully submits that the Examiner's assumption involves a basic misunderstanding as to evaluations of X-ray diffraction half widths of self-supported nitride semiconductor substrates in a {20-24} diffraction plane and refer specifically to the Examiner's interpretation of the disclosure of Melnik.

Further, Table A establishes that the inherent results urged by the Examiner do not invariably occur.

It is well settled that for an anticipation rejection to be properly based on inherency, the results must invariably occur. Table A establishes this is not the case in the present situation. See *In re Robertson*, 169 F.3d 743, 49 USPQ 2d 1949 (Fed. Cir. 1999) and *Ex parte Gleave*, 84 USPQ 2d 1681 (Board of Patent Appeals and Interferences 2006).

Applicant thus submits that it is clear from the foregoing that the formation of a self-supported nitride semiconductor substrate which simultaneously has not only a large size, namely a thickness of 200 μm or more and a diameter of 10 mm or more, but which also has an X-ray diffraction half width of 500 seconds or less in a {20-24} diffraction plane has been provided for the first time by the present invention.

Moreover, Applicant wishes to emphasize that the present invention was achieved by the finding of the Inventor of the present application that an X-ray diffraction half width of (unsymmetric) {20-24} diffraction plane is proper as an evaluation standard replacing the half width of an X-ray rocking curve of the{0002} symmetric diffraction planes and when the X-ray diffraction half width of 500 seconds or less in a {20-24} diffraction plane is satisfied, it is possible to obtain a self-supported nitride semiconductor substrate for producing light-emitting devices capable of providing high emission power at low driving voltage. See the present specification at page 3, lines 6-14.

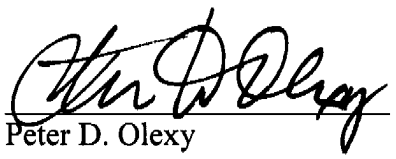
Applicants respectfully submit that they have established that the features of the present invention above discussed are not suggested in either Melnik or Albrecht, taken alone or in any combination.

Withdrawal is requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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